IDENTIFYING PRIORITY AREAS FOR ECOSYSTEM SERVICES UNDER LAND USE CHANGE

http://wildexperiments.files.wordpress.com/2011/05/oostvaardersplassen-konik-horses-running-hans-kampf-cropped.jpg

VU VRIJE UNIVERSITEIT AMSTERDAM

LOOKING FURTHER

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OPERAs

PRIORITY LOCATIONS FOR ECOSYSTEM SERVICES

Aichi target 11 to **protect 17% of the land** for biodiversity and ecosystem services

Long tradition in Conservation Biology to identify priority areas for biodiversity conservation (using tools like Marxan, Zonation) with new applications in ecosystem service research (Duran et al., 2015, Schröter et al., 2014, Chan et al. 2006)

Mostly static assessments without considering land use change; or if land use change is considered, it is considered as a threat (i.e. steering priority areas away from areas subject to land use change).

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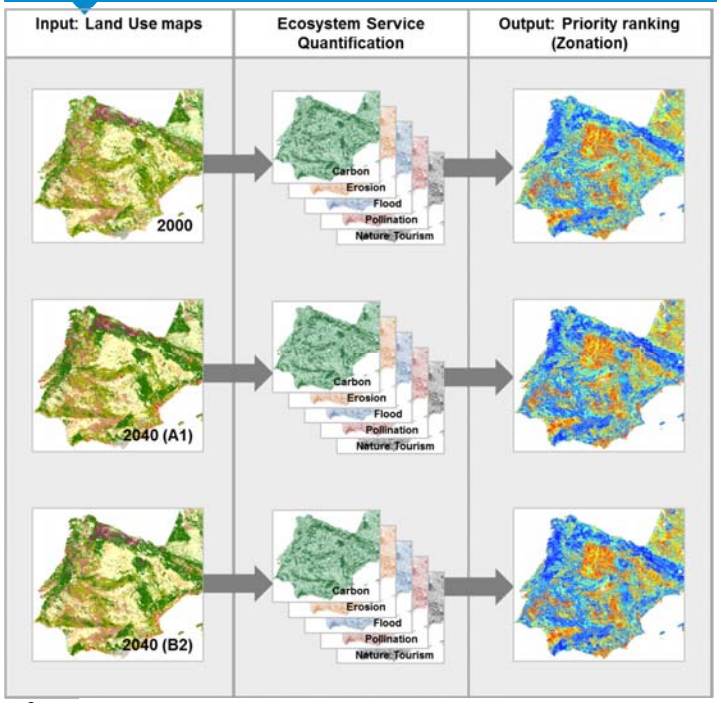
VU

STUDY SETUP



Land use scenarios based on Volante

5 ES modelled under current and future land use

Priority ranking (Zonation) based on these 5 ES

Study (projected) LUC in these priority areas

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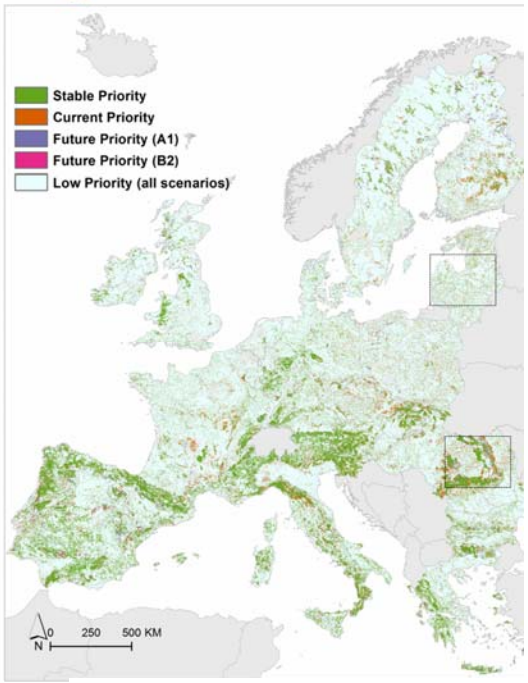
CHANGES IN PRIORITY LOCATIONS



Overlap between current and future priority areas (top 17%) ranges between 69.4% (scenA1) - - 72.8% (ScenB2)

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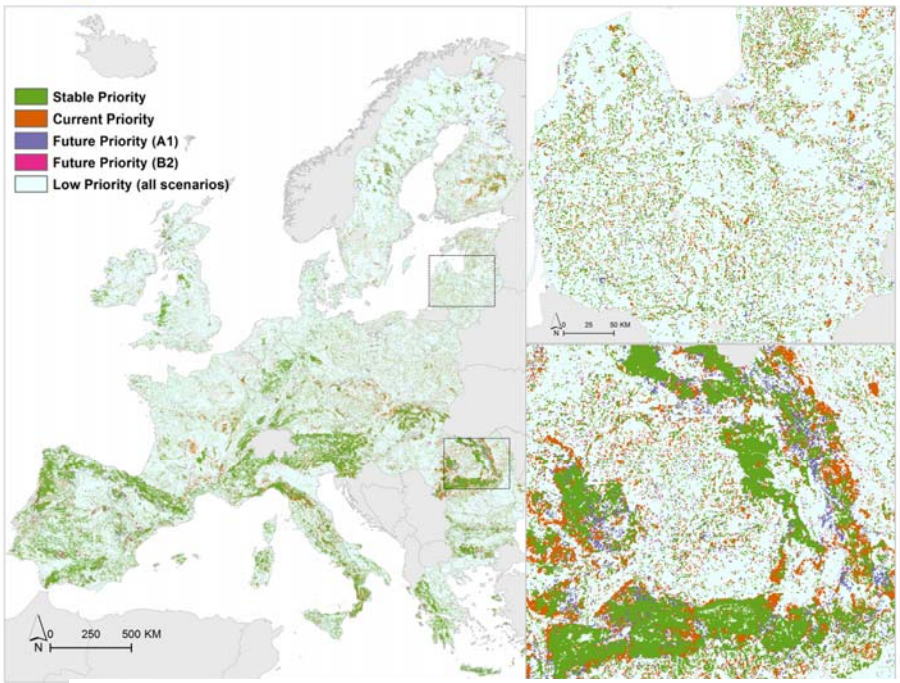
CHANGES IN PRIORITY LOCATIONS



Pattern 1: fully scattered priorities. No pattern in change

Pattern 2: clustered stable priorities with shifting priorities at edges

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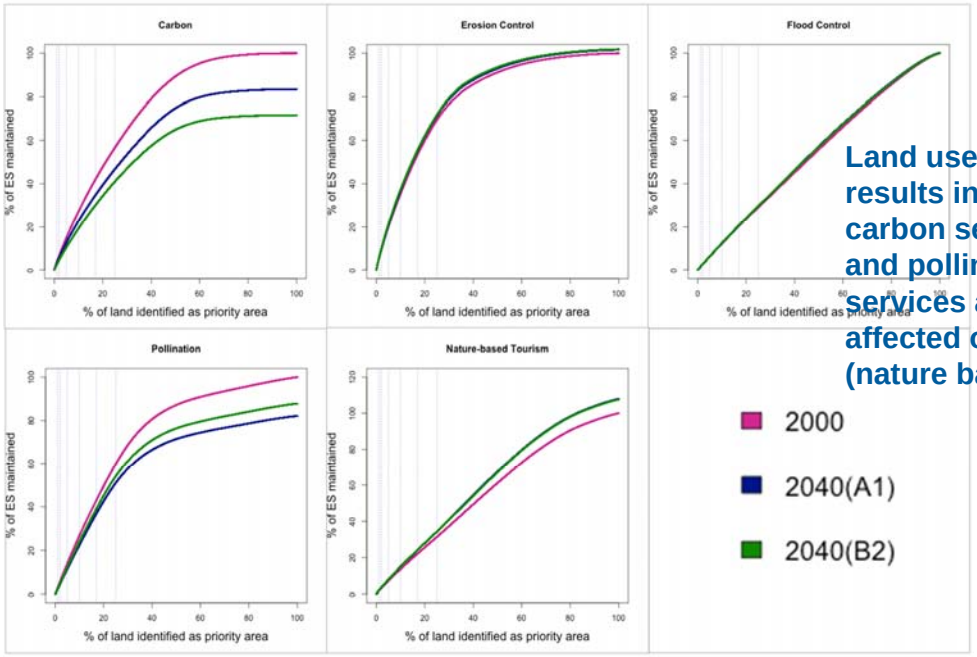
CHANGES IN ECOSYSTEM SERVICES- EU SCALE



Land use change only results in decreases of carbon sequestration and pollination. Other services are not affected or increase (nature based tourism)

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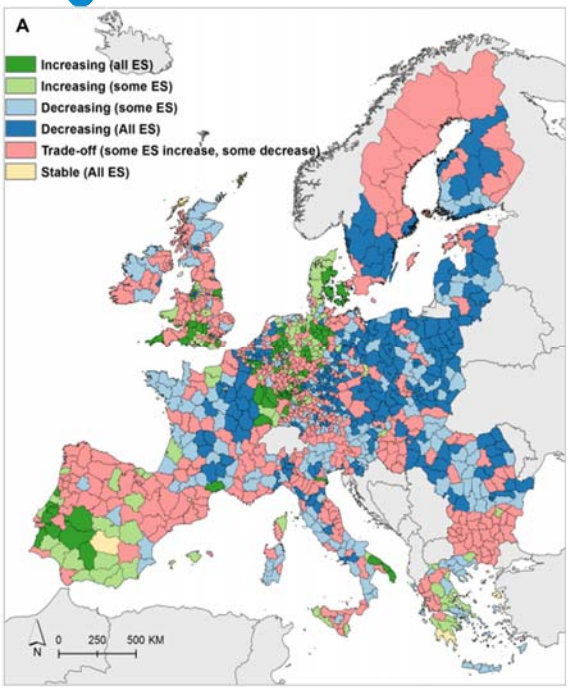
ECOSYSTEM SERVICES AT REGIONAL SCALE



At regional level almost no areas without changes in ES capacity.

Land use change results in trade-offs at regional scale. In these areas some ES increase and others decrease following land use change

Majority of ES benefits is at local to regional scale highlighting importance to analyze changes in ES at multiple scales

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WHAT IS DRIVING THE SHIFTS?

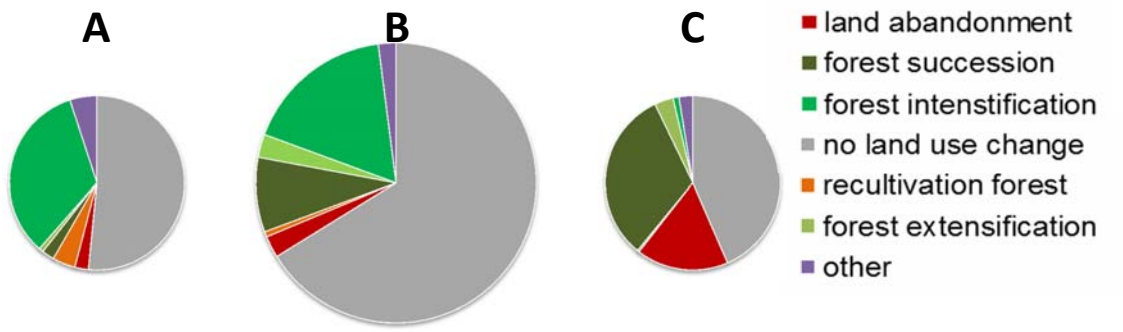

Figure 5: Overlap between land use change and three sets of priority areas:

(A) priority areas only under current land use,
(B) stable priorities under both current and future land use (A1 scenario) and
(C) priorities only under future land use (A1 scenario).
The area of the respective pie charts depicts the difference in land area.
Results are presented for the top 17% priority areas.

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WHAT IS DRIVING THE SHIFTS?

- Current priority areas are mostly threatened by forest intensification → **underlines importance of land management**
- Agricultural abandonment and forest succession leads to areas important for ES in the Future → **opportunity to navigate land use change for ES benefits**
- Many areas lost/gained priority, while having stable land use → land use change elsewhere affected the relative importance of areas. e.g. *Pollination* and *nature-based tourism* are sensitive to changes in the wider landscape. → the identification of the exact mechanisms behind changes in priority locations is challenging, but important to consider space/time effects of land use change, negative, but also positive conseq.

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